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Preparation of Chlorine-Demand Free Water

Incidence of Communicable Diseases in the U. S.

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# Public Health Reports

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## A COMPARISON OF THE EFFECTIVENESS OF 5 AND 10 PERCENT DDT DUSTS FOR THE CONTROL OF RAT FLEAS<sup>1</sup>

By H. PAGE NICHOLSON, *Senior Assistant Scientist* and THOMAS B. GAINES,  
*Biologist, United States Public Health Service*<sup>2</sup>

Following the work of Davis (1) in which the effectiveness of DDT dust in controlling rat fleas was demonstrated, field tests were undertaken at Savannah to determine the formulations and methods of application most suitable for typhus control operations. Results of this work during 1945 indicated that dust containing 10 percent technical grade DDT and 90 percent pyrophyllite was satisfactory for general dusting work. During 1945 and 1946, the 10 percent DDT formulation was used in the large scale typhus control programs carried on jointly by State and local health departments and the United States Public Health Service with indications of excellent results. The possibility of using dusts containing a reduced amount of DDT for practical control operations has not been previously investigated.

### PROCEDURES

During the latter part of July 1946, field studies were initiated at Columbia, S. C., to determine the value of dust containing 5 percent DDT for the control of rat fleas and to compare the results with those obtained in 1945 in Savannah where 10 percent dust was used. Seventeen rat infested business establishments of the same general type as those used in the Savannah investigation were treated. These establishments included 6 grocery stores, 6 cafes, a food warehouse, a wholesale vegetable produce store, a feed store, a drug store, and a paint store. In addition, 21 similar premises, located in the same general area as those treated, were used as checks. These included 7 grocery stores, 6 cafes, 2 laundries, a confectionary, a stable, a fruit

<sup>1</sup> From the Communicable Disease Center, Technical Development Division, Savannah, Ga.

<sup>2</sup> The writers express their appreciation to Dr. S. W. Simmons, Chief of the Technical Development Division for making these investigations possible and for invaluable suggestions during the studies. They also thank Dr. C. A. Henderson, Director of the Savannah-Chatham County Health Department, Savannah, Ga., Dr. C. C. Caughman, Director of the City Health Department, Columbia, S. C., and their staffs for aid and cooperation in the work.

stand, a variety store, a drug store, and an ice cream parlor. All establishments, both treated and check, were located in the vicinity of the main business district and comprised an area having a radius of  $1\frac{1}{2}$  miles.

For evaluating the effectiveness of the 5-percent mixture, live rats were trapped prior to treatment, 6 to 8 days following treatment and thereafter at approximate intervals of 6 weeks. Sampling was discontinued at the end of about 3 months because of the drastic reduction in the normal rat flea population due to the approach of winter. Maximum duration of effective control was not determined for this reason.

Ectoparasites were collected from the rats by a combination of combing and beating. This method has been described in detail in a previous paper by Ludwig and Nicholson (2).

A total of five species of fleas was taken throughout the course of the study. *Xenopsylla cheopis* (Roth.), the oriental rat flea, was by far the most abundant of these species. Other species collected were: *Nosopsyllus fasciatus* (Bosc.), *Leptopsylla segnis* (Schönherr), *Echidnophaga gallinacea* (Westwood), and *Ctenocephalides felis* (Bouché).

A number of other species of ectoparasites also were present. These included the mites, *Liponyssus bacoti* (Hirst), *Laelaps nuttalli* (Hirst), *Echinolaelaps echidninus* (Berlese), *Atricholaelaps glasgowi* (Ewing), and three unidentified species of the genera *Atricholaelaps*, *Cosmolaelaps*, and *Uropoda*. Only one species of louse, *Polyplax spinulosa* (Berm.), was taken.

No claim is made for controlling rat mites or lice with 5 percent DDT dust. Although there were indications of some initial control of these ectoparasites, extreme variations in the number of mites and lice present on the rats examined make it inadvisable to draw any conclusions from the data available.

The 5 percent DDT dust was applied in the same manner as the 10 percent DDT dust. Stress was placed upon dusting rat burrow systems and enclosed harborage areas, with which rat nests are usually associated. For this purpose the Cyanogas Foot Pump<sup>3</sup>, fitted with a 5-pound capacity dust chamber, was used (fig. 1). This piece of dusting equipment proved excellent for dispersing dust throughout the entire burrow system or enclosed harborage area.

As a secondary means of treatment, 5 percent DDT dust was applied in generous patches on active rat runs and into and around rat holes. Two types of shaker cans were used for this purpose—one a rectangular can of about 5-pound capacity and the other, a 1-pound capacity cylindrical can mounted on a 3-foot handle (fig. 2). The latter shaker was well adapted for use in dusting runways not accessible

<sup>3</sup> The Cyanogas Foot Pump is a product of the American Cyanamid & Chemical Corp., New York, N. Y.

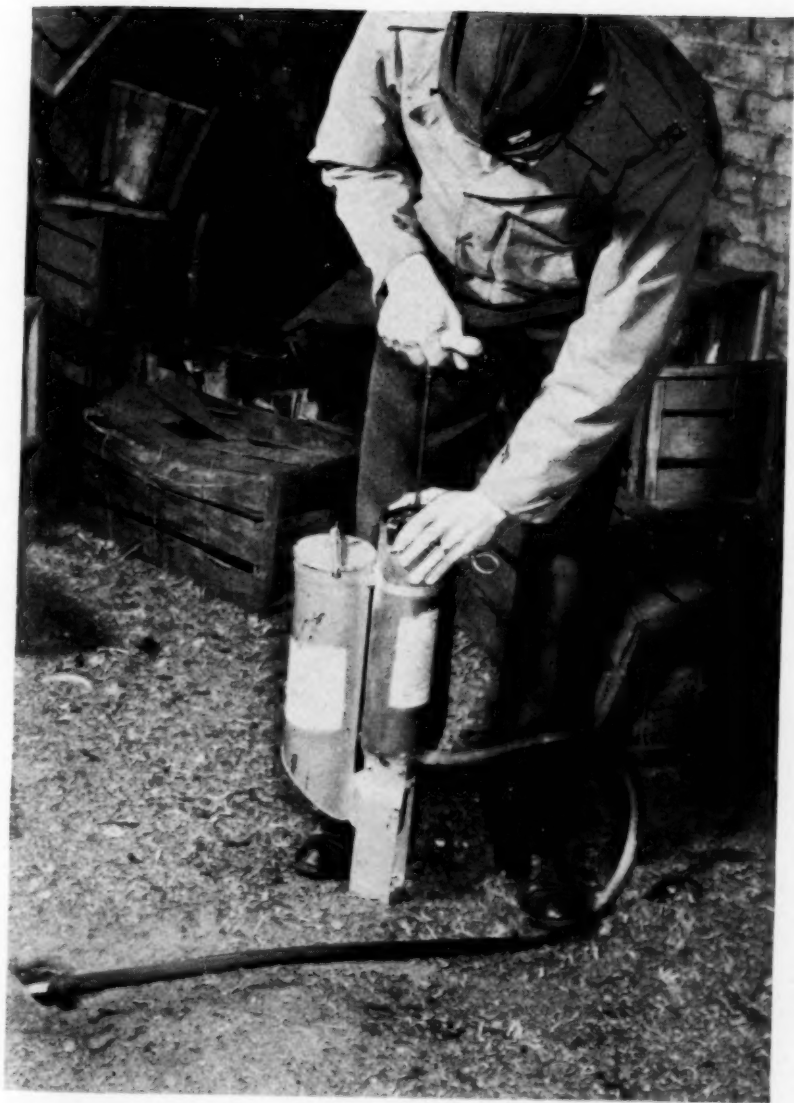


FIGURE 1.—Cyanogas gun in use (taken from Ludwig and Nicholson (2)).

to the large can and in treating such places as overhead runways. These dusters have been described in detail by Ludwig and Nicholson (2).

The amount of dust used per premise varied with the size of the establishment and the degree of rat infestation. In the series of tests with 10 percent DDT, the first three premises received an unnecessarily large amount of dust, but thereafter the amount applied per premise was comparable between the 5 percent and 10 percent formulations. Exclusive of these first three establishments, an average of 6 pounds of dust was applied per premise in both 5 and 10 percent studies. The range of these applications varied from  $1\frac{3}{4}$  to  $14\frac{1}{2}$  pounds.

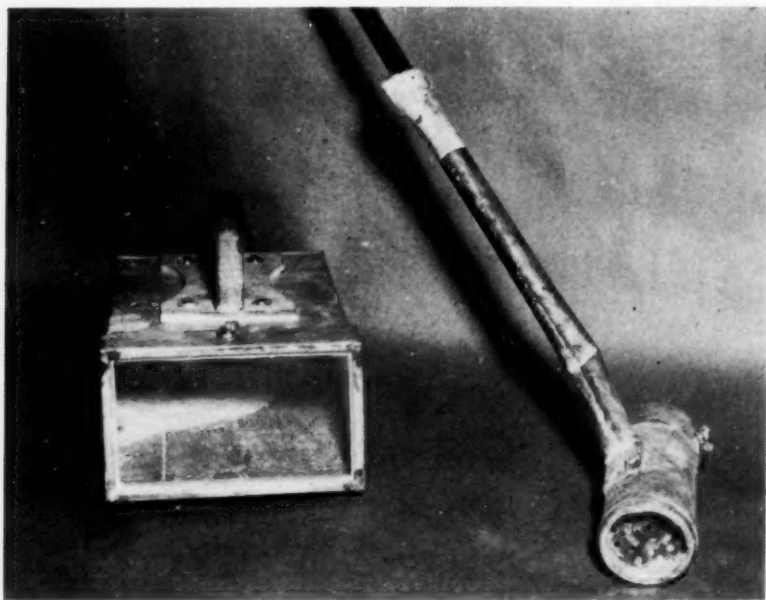


FIGURE 2.—Rectangular and cylindrical dust cans (taken from Ludwig and Nicholson (2)).

#### RESULTS

A comparison of the results obtained with these two formulations is based primarily on the control achieved against *Xenopsylla cheopis* (Roth.), the oriental rat flea, because it was by far the predominant species of flea present. Other species of fleas formed a comparatively minor part of the total flea populations.

The normal population of *X. cheopis* in the check establishments during both the 5 percent and 10 percent DDT investigations are shown graphically in figure 3 and are compared with the populations in the treated establishments. Each point on the curves is an index, or arithmetic mean, of the *X. cheopis* population from the particular group of establishments concerned.

Because trapping was necessary over a period of several nights during each sampling period in order to obtain adequate live samples of rats, the positions of the points on the horizontal axis, or days-after-treatment scale, represent average trapping dates.

Check establishments for the 10 percent DDT studies were chosen so as to be representative of the city as a whole. In all, 46 business establishments of the same general type as those treated were used as checks. From them a total of 384 rats was taken, the catch ranging from 31 to 70 for each trapping period. A total of 206 rats was taken from 11 treated establishments, the catch varying from 48 to 59 per trapping period. With the exception of 6 *Rattus rattus*, all of the rats trapped in the 10 percent DDT field studies were the brown rat, *Rattus norvegicus*.

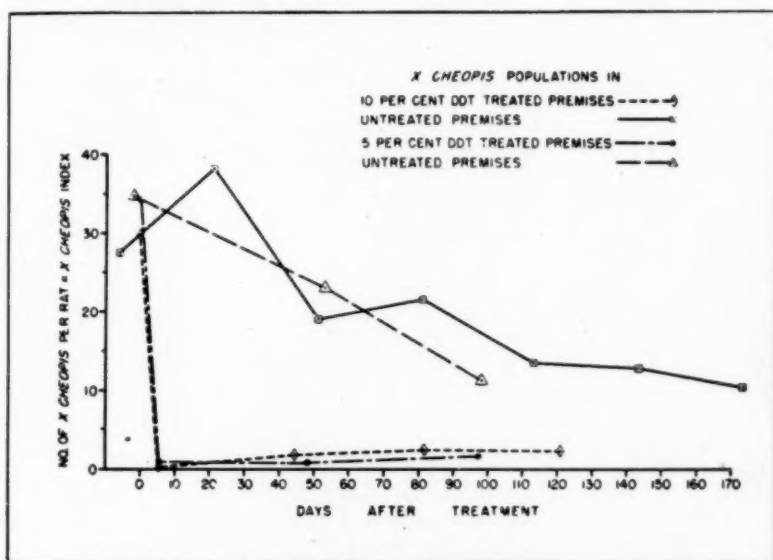


FIGURE 3.—Comparison of 5 and 10 percent DDT dusts applied for control of the oriental rat flea, *Xenopsylla cheopis* (Roth.).

In the 5-percent studies the population of *X. cheopis* in the check establishments was determined from 172 rats. The catch per trapping period ranged from 42 to 77 rats. A total of 218 rats was taken from the 17 treated premises, with catches ranging from 52 to 110 per trapping period. All rats caught were of one species, *Rattus norvegicus*.

It should be noted (fig. 3 and table 1) that the rat flea populations were almost completely eliminated within approximately 1 week after application of both the 5 percent and the 10 percent dusts. These outstanding reductions occurred consistently in the individual treated establishments as shown in table 2. At the end of a period of roughly 3 months, in the case of both 5 percent and 10 percent DDT, recovery had not occurred to a significant degree.

TABLE 1.—Comparative data from DDT-treated establishments and check establishments

## DDT-TREATED ESTABLISHMENTS

5 percent DDT				10 percent DDT			
Days after treatment	Number of rats	<i>X. cheopis</i> index	Total fleas index	Days after treatment	Number of rats	<i>X. cheopis</i> index	Total fleas index
6.....	52	0.7	0.9	6.....	59	0.2	0.3
48.....	110	0.9	1.6	44.....	50	1.7	1.7
97.....	56	1.6	1.8	81.....	49	2.6	2.7
				121.....	48	2.3	2.6

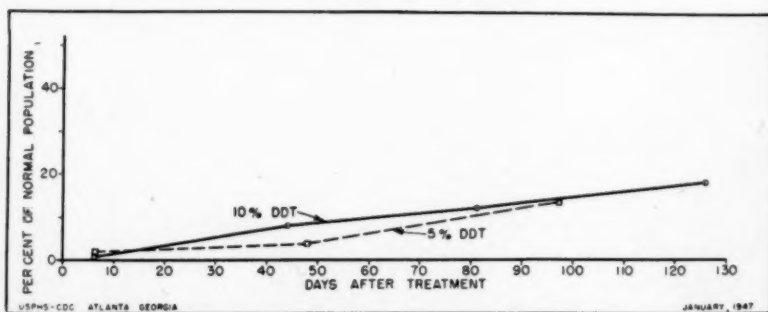
## CHECK ESTABLISHMENTS

-2 (pretreatment).....	77	34.7	38.3	-6 (pretreatment).....	70	27.5	38.9
53.....	53	23.3	26.6	21.....	31	38.1	38.7
98.....	42	11.6	17.7	51.....	42	19.2	19.4
				81.....	86	21.5	21.6
				112.....	72	13.5	14.1
				143.....	35	12.9	14.4
				173.....	48	10.6	11.4

<sup>1</sup> One aberrant rat with 71 *X. cheopis* and 2 *E. gallinacea* is not included in the indices. Out of 12 other rats caught from the same establishment and at the same time, 10 had no fleas, 1 had 2, and a third had 4. The aberrant rat may have been an invader which had not yet contacted the DDT dust. If counted, the indices would be 2.0 and 2.2.

<sup>2</sup> One aberrant rat with 354 *X. cheopis* not included in the indices above. Indices, if included, are 29.4 and 32.7.

Comparative population recovery and control of *X. cheopis* in treated premises, expressed as percent of the normal population, are indicated in table 3. These percentages were determined for the first posttreatment period (6 days after treatment) by directly comparing pre- and posttreatment flea indices. Thereafter they were obtained by a comparison of the indices in treated and check establishments. It will be noted that the difference in the initial control achieved in the 5-percent series (98.0 percent) and in the 10 percent series (99.3 percent) was insignificant and that, even after a period of 3 months, there apparently still were no significant differences in the degree of recovery by *X. cheopis* following application of either concentration of DDT dust (fig. 3 and 4, and table 3).

FIGURE 4.—Comparative recovery by the oriental rat flea, *Xenopsylla cheopis* (Roth.), following treatment with 5 and 10 percent DDT dusts.

The duration of control resulting against species of fleas other than *X. cheopis* could not be determined beyond the first posttreatment period in either the 5 or 10 percent DDT studies because these species were taken only in small numbers from check establishments during the later sampling periods. As indicated in table 2, however, they appear to be as readily controlled as *X. Cheopis* at the sampling period 1 week following each type of treatment.

In the 5 percent DDT studies *Echidnophaga gallinacea*, the stick-tight flea, was the only flea species other than *X. cheopis* present in numbers large enough to consider. While 152 specimens were collected from 13 rats taken in 5 establishments before treatment, only 7 *E. gallinacea* were taken from a total of 3 rats caught in 3 establishments during the first posttreatment trapping period.

TABLE 2.—Initial results of DDT dusting for rat flea control<sup>1</sup>

5 percent DDT				10 percent DDT			
Type establishment	Rats trapped	Flea indices		Type establishment	Rats trapped	Flea indices	
		<i>X. cheopis</i>	Other species			<i>X. cheopis</i>	Other species
Wholesale grocery.....	3	39.0	0.7	Wholesale grocery.....	8	10.0	18.4
	5	1.6	.0		4	.0	.0
Grocery warehouse.....	8	82.3	11.3	Poultry hatchery.....	2	30.0	.5
	3	.7	.0		3	.0	.0
Pharmacy.....	3	23.0	.3	Wholesale grocery.....	10	42.6	37.3
	2	.5	.0		8	1.0	.1
Paint store.....	3	21.7	.0	Wholesale grocery.....	5	5.8	9.8
	3	.0	.0		2	.5	.5
Cafe.....	2	54.0	.0	Produce & Poultry Co..	7	5.1	1.3
	2	.0	.0		6	.0	.0
Retail grocery.....	1	19.0	109.0	Feed and pet store.....	5	28.6	2.0
	2	.0	.5		1	1.0	.0
Cafe.....	6	95.8	3.2	Poultry company (abat-	7	40.0	28.9
	2	.0	.0	toir).....	6	.0	.0
Wholesale produce.....	4	14.0	3.5	Retail grocery.....	8	57.5	.0
	0				10	.1	.0
Retail grocery.....	5	36.2	.0	Retail grocery.....	6	22.7	.1
	0				6	.2	.0
Cafe.....	7	14.4	.0	Cafe.....	8	29.5	.3
	5	3.2	.0		7	.0	.0
Retail grocery.....	6	36.0	5.3	Retail grocery.....	4	10.2	.0
	4	.0	1.0		6	.0	.0
Cafe.....	1	14.0	.0				
	1	1.0	.0				
Cafe.....	7	10.6	.0				
	4	.0	.0				
Feed store.....	9	18.8	.0				
	12	.5	.0				
Retail grocery.....	4	15.5	3.0				
	1	.0	1.0				
Retail grocery.....	3	27.3	.0				
	1	.0	.0				
Cafe.....	5	17.8	.0				
	5	.8	.0				
Totals.....	77	34.7	3.6	Totals.....	70	27.5	11.4
	52	.7	.2		59	.2	.1

<sup>1</sup> For each establishment, the first figures represent pretreatment and the second, the first posttreatment evaluation period. In the 5 percent DDT studies, the mean pretreatment trapping date was 2 days prior to treatment, while in the 10 percent DDT studies it was 6 days prior to treatment. The mean trapping date for the first posttreatment evaluation period was 6 days following treatment in both the 5 and 10 percent DDT tests.

<sup>2</sup> One aberrant rat with 71 *X. cheopis* and 2 *E. gallinacea* is not included. If counted, indices would be 5.9 and 0.2 respectively. See footnote 1 on table 1.

TABLE 3.—Comparative control and recovery following DDT dusting, of *X. cheopis* expressed as percent of the normal population

5 percent DDT			10 percent DDT		
Days after treatment	Percent recovery and survival	Percent control	Days after treatment	Percent recovery and survival	Percent control
6.....	2.0	98.0	6.....	0.7	99.3
48.....	3.9	96.1	44.....	8.8	91.2
97.....	13.5	86.5	81.....	12.1	87.9
			121.....	17.4	82.6

In the 10 percent DDT studies approximately the same results were obtained, but a more varied population of fleas other than *X. cheopis* was present prior to treatment. At the pretreatment trapping period, 39 out of a total of 77 rats bore 31 *Nosopsyllus fasciatus*, 462 *Leptosylla segnis*, 238 *Echidnophaga gallinacea*, and 72 *Ctenocephalides felis*. Roughly a week following treatment with 10 percent DDT dust these same establishments yielded 59 rats, 3 of which bore a total of 3 fleas other than *X. cheopis*—2 *N. fasciatus* and 1 *L. segnis*. These three rats were caught from three separate establishments.

## SUMMARY

Comparative data are presented concerning the effectiveness of single applications of 5 and 10 percent DDT dust applied under field conditions to control rat fleas in business establishments. No significant differences could be detected over a period of 3 months. *Xenopsylla cheopis* (Roth.), the oriental rat flea, was the predominant species present. Other species of rat fleas were scarce both in treated and check establishments, especially during the later phases of the investigations. For this reason comparisons are based primarily upon the oriental rat flea.

## REFERENCES

- (1) Davis, David E. The control of rat fleas (*Xenopsylla cheopis*) by DDT. Pub. Health Rep. **60**: 485-489 (1945).
- (2) Ludwig, R. G. and Nicholson, H. P.: The control of rat ectoparasites with DDT. Pub. Health Rep. **62**: 77-84 (1947).

## NOTES ON THE PREPARATION OF CHLORINE-DEMAND-FREE WATER<sup>1</sup>

By STEPHEN MEGREGIAN, *P. A. Sanitarian, United States Public Health Service*

In the studies on the chemical and bactericidal properties of "free" chlorine and chloramine in water, large quantities of chlorine-demand-free water were required at this laboratory. Several methods of preparation were attempted, including the method outlined in Standard Methods (1), but only one was found to be satisfactory for these studies.<sup>2</sup>

Water prepared by the procedure described in Standard Methods was found unsatisfactory because of two factors. First, the chlorine demand of the distilled water sometimes could not be satisfied by a 0.5 p. p. m. chlorine dose. Secondly, it was difficult to remove the residual chlorine by boiling in a water buffered at about pH 6.0. In another method, distilled water was dosed with 2.0 to 5.0 p. p. m. of chlorine, allowed to stand 24 hours, then partially dechlorinated with sulfite to a residual of about 0.1 p. p. m. chlorine, and boiled. After boiling, the water was cooled and any remaining residual was removed by further addition of sulfite and vigorous shaking to oxidize any excess of sulfite. This method proved quite satisfactory for the studies on the chemical properties of chloramines, but did not stand up well in the low residuals (0.02 to 0.05 p. p. m.) required for the studies of bactericidal properties of "free" chlorine. The possibility of dechlorination by exposure to sunlight was also investigated, but the time required to dechlorinate 0.6 p. p. m. of free chlorine proved impractical (from 6 to 24 hours of sunlight), depending on the type of glass in which the water was stored, and also on the presence and quality of sunlight.

The method found most satisfactory and which is recommended is as follows: A carboy of distilled water was dosed with 2.0 to 5.0 p. p. m. of available chlorine with a standard chlorine or hypochlorite solution and allowed to stand at least 24 hours. Just before the water was to be used, it was boiled, cooled by storing in a 20° C. room for 24 hours, and then carefully dechlorinated in gradual steps, using a freshly prepared 0.2 percent solution of sodium sulfite. The dechlorination was carried out so that the last trace of chlorine was removed with only a slight excess of sulfite and any excess sulfite was destroyed by stoppering the bottle and vigorously shaking the contents in order to facilitate the oxidation of sulfite with dissolved oxygen. After dechlorination, the water was tested for chlorine demand by adding a calculated amount of chlorine (0.05 to 0.10 p. p. m.) to a portion of the

<sup>1</sup> From the Sanitary Engineering Division.

<sup>2</sup> The procedures reported herein were developed prior to 1943. Reference to their use is made in Public Health Reports 58, No. 51, p. 3 (Dec. 17, 1943). Formal publication of these notes has been delayed due to the transfer of the personnel familiar with the work to other duties during the war years.

prepared water, allowing it to stand at least 5 minutes, and determining the residual with ortho-tolidine. With free chlorine the total color is developed within 1 minute. The drop in chlorine residual after the 5 minutes of contact was not greater than 0.01 p. p. m. In fact, no drop in residual chlorine occurred if the dechlorination and aeration were carried out carefully. Water thus prepared gave the Laux (2) and the Moore (3) qualitative "flash" test for "free" chlorine after the 5 minutes of contact.

If the prepared water is to be used in bacteriological experiments, it should not be sterilized in an autoclave as the steam in the autoclave usually contains ammonia and other volatile materials which will impart a chlorine demand to the prepared water. Also, if the water is left unstoppered for a sufficient period in the laboratory atmosphere, ammonia will gradually dissolve in the prepared water and produce a chlorine demand. The water for the bacteriological experiments was boiled in a cotton plugged flask for 20 minutes in order to kill vegetative organisms. All glassware in contact with the prepared water should be chemically clean. In this laboratory, the glassware was cleaned with chromic acid followed by at least 10 rinses with tap water and 2 rinses with chlorine-demand-free water before sterilization in the hot-air oven. As a rule, chlorine-demand-free water should be prepared fresh for immediate use as it does not keep well over 48 hours.

Water prepared by the above method has been used in experiments on the bactericidal properties of free chlorine. Tables 1-4 illustrate the performance of this prepared water with regard to the maintenance of "free" chlorine residuals. The data in these tables were obtained in a series of experiments on the bactericidal properties of free chlorine.

#### DISCUSSION

The results presented in tables 1, 2, 3, and 4 show an average chlorine loss of 0.000 to 0.004 p. p. m. after 5 minutes of contact with the prepared water. Most of the experiments at pH values above 8.5 show no loss at all even in the lowest concentration of free chlorine dosed. The column showing maximum loss of chlorine after 5 minutes contact serves to point out that extraneous chlorine demand can easily be introduced even under the most carefully controlled experimental conditions. These losses are more significant in the extremely low concentrations of free chlorine in that a trace of chlorine demand may react with all the applied chlorine whereas in the higher concentrations, any slight chlorine loss cannot be readily measured by the present methods for determining residual chlorine. Therefore, when working with extremely low concentrations of chlorine in chlorine-demand-free water, every precaution should be taken not to introduce organic matter into the reaction mixture. Losses in chlorine residual

which are noted in the columns marked footnote 1 may be attributed to the introduction of the bacterial suspension and the absorption of chlorine by these organisms. These bacterial suspensions also contain soluble nutrient materials leached out of the agar slants on which the bacteria are cultured. However, these data indicate that the chlorine demand of such cultures for 1 hour contact is relatively small in a chlorine-demand-free water.

TABLE 1.—*Stability of Chlorine Residuals in Chlorine-Demand-Free-Water at pH 7.0*

Number of experiments included in averages	Chlorine dosage p. p. m.	Average free chlorine residual, p. p. m., after—			Maximum chlorine lost p. p. m., after—			Temp. °C.
		5 minutes	60 minutes <sup>1</sup>	120 minutes <sup>1</sup>	5 minutes	60 minutes <sup>1</sup>	120 minutes <sup>1</sup>	
20.....	0.02	0.016	-----	0.010	0.015 <sup>2</sup>	-----	0.02 <sup>3</sup>	20-25
16.....	.03	.026	-----	.019	.01 <sup>6</sup>	-----	.02 <sup>4</sup>	20-25
14.....	.04	.037	-----	.031	.02 <sup>1</sup>	-----	.03 <sup>1</sup>	20-25
13.....	.05	.046	-----	.040	.02 <sup>1</sup>	-----	.03 <sup>1</sup>	20-25
9.....	.06	.060	-----	.051	.01 <sup>1</sup>	-----	.02 <sup>2</sup>	20-25
9.....	.08	.079	0.072	-----	.01 <sup>2</sup>	-----	-----	20-25
4.....	.02	.020	-----	.020	.00 <sup>4</sup>	-----	.00 <sup>4</sup>	2-5
4.....	.03	.030	-----	.023	.00 <sup>4</sup>	-----	.01 <sup>3</sup>	2-5
4.....	.04	.040	-----	.038	.00 <sup>4</sup>	-----	.01 <sup>1</sup>	2-5
4.....	.05	.050	-----	.040	.00 <sup>4</sup>	-----	.01 <sup>1</sup>	2-5
2.....	.06	.060	-----	.060	.00 <sup>2</sup>	-----	.00 <sup>2</sup>	2-5
2.....	.07	.070	-----	.065	.00 <sup>2</sup>	-----	.01 <sup>1</sup>	2-5
2.....	.08	.080	.080	-----	.00 <sup>2</sup>	0.00 <sup>2</sup>	-----	2-5
2.....	.10	.100	.090	-----	.00 <sup>2</sup>	.02 <sup>1</sup>	-----	2-5

<sup>1</sup> After inoculation with the test organisms (about 2,000 organisms per cc of test water).

NOTE.—Superscripts signify the number of experiments in which the maximum chlorine loss occurred.

TABLE 2.—*Stability of Chlorine Residuals in Chlorine-Demand-Free Water at pH 8.5*

Number of experiments included in averages	Chlorine dosage p. p. m.	Average free chlorine residual, p. p. m. after—		Maximum chlorine lost, p. p. m. after—		Temperature °C.
		5 minutes	60 minutes <sup>1</sup>	5 minutes	60 minutes <sup>1</sup>	
2.....	0.03	0.030	0.025	0.00 <sup>2</sup>	0.01 <sup>1</sup>	20-25
6.....	.05	.050	.042	.01 <sup>1</sup>	.02 <sup>2</sup>	20-25
6.....	.07	.070	.062	.01 <sup>1</sup>	.04 <sup>1</sup>	20-25
4.....	.10	.100	.085	.02 <sup>1</sup>	.05 <sup>1</sup>	20-25
6.....	.15	.150	.143	.01 <sup>1</sup>	.03 <sup>1</sup>	20-25
6.....	.20	.200	.187	.00 <sup>6</sup>	.03 <sup>2</sup>	20-25
2.....	.05	.050	.045	.00 <sup>2</sup>	.01 <sup>1</sup>	2-5
2.....	.07	.070	.055	.00 <sup>2</sup>	.02 <sup>1</sup>	2-5
2.....	.10	.100	.085	.00 <sup>2</sup>	.03 <sup>1</sup>	2-5
2.....	.12	.120	.115	.00 <sup>2</sup>	.01 <sup>1</sup>	2-5
2.....	.15	.150	.150	.00 <sup>2</sup>	.00 <sup>2</sup>	2-5
1.....	.20	.20	.17	.00 <sup>1</sup>	.03 <sup>1</sup>	2-5

<sup>1</sup> After inoculation with the test organisms (about 2,000 organisms per cc. of test water).

NOTE.—Superscripts signify the number of experiments in which the maximum chlorine loss occurred.

TABLE 3.—*Stability of Chlorine Residuals in Chlorine-Demand-Free Water at pH 9.8*

Number of experiments included in averages	Chlorine dosage p. p. m.	Average free chlorine residual, p. p. m. after—		Maximum chlorine lost, p. p. m. after—		Temperature °C.
		5 min-utes	60 min-utes <sup>1</sup>	5 min-utes	60 min-utes <sup>1</sup>	
2.....	0.03	0.030	0.030	0.00 <sup>2</sup>	0.00 <sup>2</sup>	20-25
5.....	.05	.050	.046	.01 <sup>1</sup>	.01 <sup>2</sup>	20-25
8.....	.10	.100	.096	.00 <sup>8</sup>	.02 <sup>1</sup>	20-25
2.....	.15	.150	.140	.00 <sup>2</sup>	.02 <sup>1</sup>	20-25
3.....	.20	.200	.187	.00 <sup>3</sup>	.02 <sup>2</sup>	20-25
3.....	.25	.250	.240	.00 <sup>3</sup>	.03 <sup>1</sup>	20-25
5.....	.30	.296	.268	.02 <sup>1</sup>	.05 <sup>2</sup>	20-25
5.....	.40	.400	.364	.00 <sup>5</sup>	.05 <sup>2</sup>	20-25
2.....	.50	.500	.460	.00 <sup>2</sup>	.04 <sup>2</sup>	20-25
2.....	.70	.700	.675	.00 <sup>2</sup>	.05 <sup>1</sup>	20-25
2.....	1.00	1.000	.950	.00 <sup>2</sup>	.10 <sup>1</sup>	20-25
4.....	.05	.050	.045	.00 <sup>4</sup>	.01 <sup>2</sup>	2-5
4.....	.10	.100	.100	.00 <sup>4</sup>	.00 <sup>4</sup>	2-5
4.....	.20	.200	.200	.00 <sup>4</sup>	.00 <sup>4</sup>	2-5
4.....	.40	.400	.380	.00 <sup>4</sup>	.04 <sup>2</sup>	2-5
4.....	.70	.700	.700	.00 <sup>4</sup>	.00 <sup>4</sup>	2-5
4.....	1.00	1.000	1.000	.00 <sup>4</sup>	.00 <sup>4</sup>	2-5

<sup>1</sup> After inoculation with the test organisms (about 2,000 organisms per cc. of test water).

NOTE.—Superscripts signify the number of experiments in which the maximum chlorine loss occurred.

TABLE 4.—*Stability of Chlorine Residuals in Chlorine-Demand-Free Water at pH 10.7*

Number of experiments included in averages	Chlorine dosage p. p. m.	Average free chlorine residual, p. p. m. after—		Maximum chlorine lost, p. p. m. after—		Temperature °C.
		5 min-utes	60 min-utes <sup>1</sup>	5 min-utes	60 min-utes <sup>1</sup>	
2.....	0.02	0.020	0.020	0.00 <sup>2</sup>	0.00 <sup>2</sup>	20-25
2.....	.03	.030	.025	.00 <sup>2</sup>	.01 <sup>1</sup>	20-25
2.....	.04	.040	.035	.00 <sup>2</sup>	.01 <sup>1</sup>	20-25
5.....	.05	.050	.046	.00 <sup>5</sup>	.01 <sup>2</sup>	20-25
2.....	.07	.070	.060	.00 <sup>2</sup>	.01 <sup>2</sup>	20-25
7.....	.10	.100	.099	.00 <sup>7</sup>	.01 <sup>1</sup>	20-25
4.....	.20	.200	.195	.00 <sup>4</sup>	.02 <sup>1</sup>	20-25
3.....	.25	.250	.233	.00 <sup>3</sup>	.03 <sup>1</sup>	20-25
7.....	.30	.300	.281	.00 <sup>7</sup>	.05 <sup>1</sup>	20-25
7.....	.40	.400	.386	.00 <sup>7</sup>	.05 <sup>2</sup>	20-25
4.....	.50	.500	.490	.00 <sup>4</sup>	.04 <sup>1</sup>	20-25
3.....	.70	.700	.700	.00 <sup>3</sup>	.00 <sup>3</sup>	20-25
3.....	1.00	1.000	1.00	.00 <sup>3</sup>	.00 <sup>3</sup>	20-25
2.....	.10	.100	.100	.00 <sup>2</sup>	.00 <sup>2</sup>	2-5
2.....	.30	.300	.300	.00 <sup>2</sup>	.00 <sup>2</sup>	2-5
2.....	.40	.400	.400	.00 <sup>2</sup>	.00 <sup>2</sup>	2-5
2.....	.50	.500	.500	.00 <sup>2</sup>	.00 <sup>2</sup>	2-5
2.....	.70	.700	.700	.00 <sup>2</sup>	.00 <sup>2</sup>	2-5
2.....	1.00	1.000	1.000	.00 <sup>2</sup>	.00 <sup>2</sup>	2-5

<sup>1</sup> After inoculation with the test organisms (about 2,000 organisms per cc of test water).

NOTE.—Superscripts signify the number of experiments in which maximum chlorine loss occurred.

## REFERENCES

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## INCIDENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

November 30–December 27, 1947

The accompanying table summarizes the incidence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in PUBLIC HEALTH REPORTS under the section "Incidence of Disease." The table gives the number of cases of these diseases for the 4 weeks ended December 27, 1947, the number reported for the corresponding period in 1946, and the median number for the years 1942–46.

## DISEASES ABOVE MEDIAN INCIDENCE

*Influenza.*—For the 4 weeks ended December 27 there were 14,500 cases of influenza reported. The median incidence for the preceding 5 years (1942–46) was 11,686 cases. The current high incidence of this disease is still confined largely to 3 States: Texas (6,664 cases), South Carolina (2,013), and Virginia (1,992). Only 3 other States have reported more than 100 cases weekly—Alabama, Arizona, and California. Few cases are being reported from the North Atlantic and North Central sections.

According to reports received from State health officers there was no indication of a widespread influenza epidemic. There have been press reports of outbreaks of "colds" in some localities and an outbreak of undetermined respiratory infection, later identified as type A influenza virus, was reported in Los Angeles with 200,000 persons attacked. Later press reports say that the schools in certain sections of Texas have been closed on account of an undetermined respiratory disease, which may account somewhat for the increase in the number of cases of influenza in that State from 1,498 during the preceding week to 2,015 for the week ended December 27.

The number of cases of influenza for the year 1947 was higher than in 1946 but it was lower than in any of the 3 preceding years. The minor epidemic of 1947 did not start until March and it was midsummer before the number of cases had dropped to a normal level.

*Measles.*—The number of cases (15,344) of measles reported for the current 4-week period represented a 48 percent increase over the median for the preceding 5 years. During the early part of 1947 the incidence of this disease was considerably below that of 1946, but during the last 3 four-week periods of 1947 the cases have exceeded those reported for the corresponding periods in 1946 and for the 4 weeks ended December 27 the number of cases was the highest since 1943 when approximately 30,000 cases were reported for the corresponding weeks. During most of the year, however, the incidence was below the normal seasonal level, and the number of cases reported for the year was less than 40 percent of the median for the years 1942–46.

*Typhoid and paratyphoid fever.*—During the 4 weeks ended December 27 there were 221 cases of these diseases as compared with 166 for the corresponding period in 1946 and a median of 217 cases for the preceding 5 years. The West

South Central section reported the largest excess of cases, due largely to the occurrence of 30 cases of paratyphoid fever in Oklahoma. Pennsylvania reported 26 of the 39 cases of typhoid fever occurring in the Middle Atlantic section. In other sections the number of cases either was not significantly higher than the 1942-46 median or fell below it. Although the number of cases during the last 4 months of 1947 exceeded those reported during the same months of 1946 the total number of cases reported for the year 1947 will probably be the lowest on record for these diseases.

*Whooping cough.*—This disease continued at a relatively high level, the 9,667 cases reported for the current 4-week period being 1.1 times the 1946 incidence and 1.3 times the median for the 5 preceding years (1942-46). Each section of the country except the Middle Atlantic reported an increase in cases over the normal seasonal expectancy. This disease has maintained a relatively high incidence throughout the entire year and the number of cases (153,505) was the highest since 1943 when approximately 176,000 were reported. The annual 5-year median expectancy was about 123,000 cases.

#### DISEASES BELOW MEDIAN INCIDENCE

*Diphtheria.*—The incidence of diphtheria dropped again to a relatively low level, the number of cases (1,291) reported for the 4 weeks ended December 27 being 91 percent of the median for the preceding 5 years. The median was represented by the 1946 incidence (1,416 cases). In the South Atlantic and Mountain sections the numbers of cases were larger than might be expected normally, but in other sections the incidence either closely approximated the median or fell below it. After a slight break in the downward trend of this disease in 1944 and 1945 the incidence has started down again and the total cases for the year 1947 will be the lowest ever reported.

*Meningococcus meningitis.*—The number of cases (224) of meningococcus meningitis was 90 percent of the 1946 incidence for the corresponding 4 weeks and 45 percent of the median for the preceding 5 years. The number of cases was relatively low in all sections of the country, and for the country as a whole the incidence was the lowest since 1941 when 143 cases were reported during the corresponding 4 weeks. States reporting the largest number of cases were California 19, Pennsylvania 18, Texas 15, New York and Oklahoma 14 each, Connecticut and Ohio 11 each, and North Carolina 10. No other State reported more than 7 cases.

*Poliomyelitis.*—For the 4 weeks ended December 27 there were 360 cases of poliomyelitis reported. There were 688 cases reported during the corresponding 4 weeks in 1946 and the median for the preceding 5 years was 932 cases. The incidence remained relatively high in a few States in the East North Central, South Atlantic, and Mountain sections, but in other sections the number of cases occurring was either about normal or was considerably below the normal seasonal expectancy. After 4 years of unusually high incidence this disease has returned to a more normal level and the number of cases reported for the year 1947 will no doubt be the lowest since 1942 when approximately 4,200 cases were reported.

*Scarlet fever.*—The incidence of this disease was the lowest on record for this period. The number of reported cases (7,167) was 87 percent of the number reported in 1946 and 65 percent of the 1942-46 median for the corresponding 4 weeks. The number of cases in each geographic section was considerably below the normal median expectancy. The year 1947 was the lowest year on record for this disease, with a total of about 83,000 cases as compared with a 5-year median of approximately 140,000 cases.

*Smallpox.*—For the 4 weeks ended December 27 there were 13 cases of smallpox reported as compared with 7 for the corresponding weeks in 1946 and a median

of 28 cases for the preceding 5 years (1942-46). The cases were confined to 3 sections of the country, the East North Central (4 cases), West North Central (7 cases), and the South Atlantic (2 cases). For the first time since September 1946 the incidence for a current 4-week period was higher than during the same weeks in the preceding year. While the current incidence was slightly above the 1946 figure it was lower than in any preceding year for which data are available in this form. For the year 1947 a total of 170 cases of smallpox was reported as compared with a median of 386 cases for the preceding 5 years.

#### MORTALITY, ALL CAUSES

For the 4 weeks ended December 27 there were 38,570 deaths from all causes reported to the National Office of Vital Statistics by 93 large cities. The median number for the corresponding period in the years 1944-46 was 36,425 deaths. The number of deaths was higher than the median for the 3 preceding years in the first 3 weeks of the current period, but during the last week of the period the number of deaths was 11 percent below the 3-year median.

*Number of reported cases of 9 communicable diseases in the United States during the 4-week period November 30-December 27, 1947, the number for the corresponding period in 1946, and the median number of cases reported for the corresponding period, 1942-46*

Division	Current period	1946	5-year median	Current period	1946	5-year median	Current period	1946	5-year median
	Diphtheria			Influenza <sup>1</sup>			Measles		
United States.....	1,291	1,416	1,416	14,500	11,686	11,686	15,344	9,902	10,381
New England.....	40	104	50	14	30	102	359	2,816	2,081
Middle Atlantic.....	126	196	127	47	60	121	2,567	3,327	3,327
East North Central.....	143	197	197	112	167	341	5,668	965	1,655
West North Central.....	99	128	124	86	112	151	2,077	102	435
South Atlantic.....	328	257	248	4,517	3,734	3,755	1,325	1,343	563
East South Central.....	149	207	166	688	333	662	147	134	224
West South Central.....	218	153	272	7,911	6,100	7,444	1,169	213	316
Mountain.....	122	74	68	716	1,065	1,065	836	563	685
Pacific.....	66	100	116	409	85	237	1,196	439	1,164
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States.....	224	248	498	360	688	932	7,167	8,257	10,982
New England.....	16	18	39	9	36	16	616	898	1,172
Middle Atlantic.....	40	47	115	49	81	52	1,435	1,797	2,122
East North Central.....	28	41	99	97	178	50	2,017	2,566	2,913
West North Central.....	18	16	34	16	128	41	745	644	1,190
South Atlantic.....	33	41	87	48	49	29	636	664	1,089
East South Central.....	21	24	54	15	32	11	381	333	481
West South Central.....	32	25	43	19	61	34	245	188	392
Mountain.....	8	9	25	55	19	19	394	407	640
Pacific.....	28	27	71	52	104	87	698	758	1,128
	Smallpox			Typhoid and paratyphoid fever			Whooping cough		
United States.....	13	7	28	221	166	217	9,667	8,709	7,297
New England.....	0	0	0	16	14	16	1,257	1,044	1,068
Middle Atlantic.....	0	0	0	39	21	29	1,794	2,289	2,024
East North Central.....	4	1	6	17	20	30	2,094	2,348	1,671
West North Central.....	7	4	9	10	7	7	664	267	306
South Atlantic.....	2	0	1	37	26	39	1,270	1,065	932
East South Central.....	0	0	3	13	22	22	421	346	346
West South Central.....	0	2	4	60	23	43	1,007	770	691
Mountain.....	0	0	2	11	21	14	586	243	251
Pacific.....	0	0	0	18	12	13	574	337	544

<sup>1</sup> New York, North Carolina, and Pennsylvania excluded; New York City and Philadelphia included.

## REPORT OF BRUCELLOSIS OUTBREAK AT FEDERALSBURG, MARYLAND<sup>1</sup>

By JAMES H. STEELE, *Scientist (R), United States Public Health Service* and J. W. HASTINGS, SR., *Assistant Director, Maryland Live Stock Sanitary Service*

During January and February 1946, 28 cases of human brucellosis were reported in a small town in eastern Maryland. *Brucella abortus* was isolated by the Maryland State Health Laboratory from two human cases. The other human cases had positive blood agglutination and clinical symptoms of the disease. Epidemiological investigations by the local health department attributed the epidemic to infected milk that was distributed during the Christmas holidays by a local raw-milk dealer.

During the Christmas season there was a shortage of milk in the community and the local milk dealer purchased additional milk from an uninspected source (Herd 3). This uninspected milk was only used if the normal supply was not sufficient. In this way there was no factor of dilution which would have prevented the ingestion of a large number of organisms by the individuals who used this infected milk.

The Maryland Live Stock Sanitary Service investigated the raw-milk source and found that Herd No. 1 was accredited as being free of brucellosis as of November 15, 1946. There were 40 animals in the herd and no adulthood vaccination was practiced. Sixteen of the adult animals had been vaccinated as calves. This farm is owned by the raw-milk distributor. Since January 1946 all milk has been pasteurized.

Herd No. 2 had considerable evidence of infection. There were twelve adult cattle in the herd of which four were reactors. Three of these reactors being plus 4 and one a plus 3. This herd was tested March 4, 1946.

Herd No. 3 had fourteen adults of which seven were reactors. All reactors had high titers except one. It was reported that there had been many abortions in this herd. Three of these reactors have been sold. The remainder are being held under quarantine and the milk from these infected animals is being sold to a pasteurization plant outside the community. This supply was the uninspected milk used during the Christmas season by the local raw-milk distributor. None of the animals in this herd have been vaccinated.

This is the first large brucellosis (undulant fever) epidemic reported due to *B. abortus*. Epidemiologists and public health officials have offered various reasons why *B. abortus* has never caused any sizable

<sup>1</sup> From Veterinary Public Health Division, Communicable Disease Center, United States Public Health Service, Atlanta, Ga., and Maryland Live Stock Sanitation Board.

epidemics such as *B. suis* and *B. melitensis* have in the past, the most commonly advanced reason being that *B. abortus* was less virulent and invasive for man than *B. suis* and *B. melitensis*. This disease outbreak does not support that view but does present evidence that *B. abortus* can be the cause of an epidemic when the bacteria are present in large numbers and are not diluted by clean milk. The spread of brucellosis through milk can be stopped by the eradication of brucellosis in cattle and the pasteurization of all milk supplies.

### DEATHS DURING WEEK ENDED JAN. 3, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Jan. 3, 1948	Correspond- ing week, 1947
Data for 93 large cities of the United States:		
Total deaths.....	10, 418	10, 209
Median for 3 prior years.....	10, 209	
Deaths under 1 year of age.....	716	814
Median for 3 prior years.....	644	
Data from industrial insurance companies:		
Policies in force.....	66, 888, 938	67, 259, 940
Number of death claims.....	7, 715	10, 044
Death claims per 1,000 policies in force, annual rate.....	6.0	7.8

# INCIDENCE OF DISEASE

*No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring*

## UNITED STATES

### REPORTS FROM STATES FOR WEEK ENDED JANUARY 10, 1948

#### Summary

In the absence of any sharp localized increase in cases of influenza, the increase in reported cases from 7,315 last week to 10,335 is probably of no great epidemic significance, although the current figure is also above the 5-year (1943-47) median (4,587). States reporting the largest numbers of cases are as follows: *Increases*—Texas (2,966 to 4,712), California (315 to 1,272), Arizona (601 to 849), Arkansas (242 to 452), Alabama (83 to 277), and Virginia (839 to 849); the incidence in South Carolina declined from 1,350 to 916.

The number of cases reported since the seasonal low point of the disease affords a good comparative picture of the seasonal incidence to date. Cases reported since seasonal low (week ended between July 26 and August 1) are as follows:

Season:	Number of cases	Season:	Number of cases
1947-48.....	53, 893	1944-45.....	35, 166
1946-47.....	36, 640	1943-44.....	467, 692
1945-46.....	410, 289	1942-43.....	33, 328

A total of 41 cases of poliomyelitis was reported, as compared with 46 last week. New York reported 9 cases, Idaho and California 4 each, and no other State reported more than 3 cases.

Of 4 cases of smallpox, 2 occurred in Kansas and 1 each in Indiana and Missouri. Measles cases increased from 5,302 to 7,236, and whooping cough from 1,796 to 2,417. Diphtheria declined from 282 cases last week to 258 (366 corresponding week last year, also the 5-year median).

"Q" fever has been reported identified in Phoenix, Ariz.

Deaths, all causes, in 93 large cities in the United States increased from 10,418 to 11,313, probably reflecting increased mortality from respiratory complications. The figure for the corresponding week last year was 10,638, and for 1946 it was 11,670. Infant deaths in these cities increased from 725 last week to 822 for the current week.

*Telegraphic morbidity reports from State health officers for the week ended January 10, 1948, and comparison with corresponding week of 1947\* and 5-year median*

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Med- ian, 1943- 47	Week ended—		Med- ian, 1943- 47	Week ended—		Med- ian, 1943- 47	Week ended—		Med- ian, 1943- 47
	Jan. 10, 1948	Jan. 4, 1947		Jan. 10, 1948	Jan. 4, 1947		Jan. 10, 1948	Jan. 4, 1947		Jan. 10, 1948	Jan. 4, 1947	
NEW ENGLAND												
Maine.....	1	3	0	-----	1	1	2	260	25	0	1	2
New Hampshire.....	0	0	0	-----	1	3	2	10	6	0	0	0
Vermont.....	0	0	0	-----	-----	24	49	126	18	0	0	0
Massachusetts.....	5	21	7	-----	-----	-----	242	247	247	2	3	8
Rhode Island.....	0	0	0	-----	-----	25	-----	16	7	0	0	0
Connecticut.....	1	0	1	-----	2	11	14	84	32	3	0	2
MIDDLE ATLANTIC												
New York.....	19	25	15	11	18	117	595	112	316	8	4	22
New Jersey.....	2	4	3	2	4	27	736	120	120	2	1	15
Pennsylvania.....	4	11	13	(2)	4	27	392	778	778	4	1	10
EAST NORTH CENTRAL												
Ohio.....	2	18	18	6	5	16	348	211	40	3	6	10
Indiana.....	8	21	13	14	23	31	306	18	38	2	0	4
Illinois.....	2	3	10	1	4	13	1,181	23	169	9	6	9
Michigan.....	5	5	3	2	-----	1	422	126	52	1	4	4
Wisconsin.....	2	4	4	23	33	62	187	77	77	2	2	2
WEST NORTH CENTRAL												
Minnesota.....	7	9	4	-----	-----	-----	398	6	6	0	0	1
Iowa.....	2	0	5	-----	-----	2	157	1	21	0	4	3
Missouri.....	5	8	3	9	1	6	29	6	24	0	2	7
North Dakota.....	0	3	3	1	2	25	34	2	1	1	1	1
South Dakota.....	0	0	1	-----	-----	-----	13	7	10	0	1	1
Nebraska.....	1	0	4	21	-----	60	7	1	12	1	1	1
Kansas.....	6	3	4	62	36	36	10	4	46	2	1	1
SOUTH ATLANTIC												
Delaware.....	0	0	0	-----	-----	-----	30	-----	2	0	0	0
Maryland.....	18	14	10	-----	5	9	11	10	10	1	0	6
District of Columbia.....	0	0	0	-----	1	5	44	15	9	2	2	2
Virginia.....	9	3	5	849	615	659	78	86	85	1	1	9
West Virginia.....	2	12	3	112	65	65	350	22	22	4	6	5
North Carolina.....	14	8	13	-----	-----	-----	6	160	53	4	2	8
South Carolina.....	13	18	7	916	789	789	33	45	45	0	6	6
Georgia.....	6	18	13	48	12	181	13	89	19	0	0	2
Florida.....	7	6	6	4	7	7	26	1	8	0	0	2
EAST SOUTH CENTRAL												
Kentucky.....	7	21	4	3	3	3	9	-----	66	4	2	4
Tennessee.....	6	16	10	168	22	89	37	8	39	3	1	6
Alabama.....	8	8	8	277	69	413	8	27	9	2	2	4
Mississippi.....	7	14	13	43	-----	-----	21	-----	-----	1	3	3
WEST SOUTH CENTRAL												
Arkansas.....	6	1	7	452	53	179	50	13	13	1	1	1
Louisiana.....	3	18	9	135	3	21	5	11	11	0	1	2
Oklahoma.....	7	2	5	124	90	171	8	10	10	2	1	3
Texas.....	24	27	48	4,712	1,431	2,250	524	25	90	7	8	9
MOUNTAIN												
Montana.....	4	1	1	12	44	44	87	70	38	0	0	0
Idaho.....	0	1	1	46	19	17	5	4	24	1	0	1
Wyoming.....	0	0	1	-----	14	14	19	2	3	0	0	0
Colorado.....	4	8	6	99	22	45	59	2	29	1	2	2
New Mexico.....	3	1	3	-----	2	1	-----	8	3	1	0	1
Arizona.....	2	7	3	849	209	209	3	64	7	0	0	1
Utah.....	3	0	0	3	28	32	13	10	14	0	1	1
Nevada.....	0	0	0	-----	-----	-----	-----	-----	4	0	0	0
PACIFIC												
Washington.....	2	10	10	1	-----	-----	162	20	25	1	0	2
Oregon.....	8	3	3	68	25	25	21	29	54	0	0	7
California.....	20	11	30	1,272	13	35	490	29	210	9	6	21
Total.....	258	366	366	10,335	3,665	4,587	7,236	2,995	2,995	85	83	238
Seasonal low week <sup>4</sup> .....	(27th) July 5-11			(30th) July 26-Aug. 1			(35th) Aug. 30-Sept. 5			(37th) Sept. 13-19		
Total since low.....	6,616	7,932	8,771	53,893	36,640	36,640	42,182	25,882	28,893	867	1,055	1,695

\*For the purpose of weekly comparisons of these reports over a period of years, the first week of the year is taken to be that week which has four or more days of the new year. Thus there may be a maximum difference of six days between the dates of comparable weeks of two years.

<sup>1</sup> New York City only.

<sup>2</sup> Philadelphia only.

<sup>3</sup> Period ended earlier than Saturday.

<sup>4</sup> Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended January 10, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and para-typhoid fever		
	Week ended—		Med-ian 1943-47	Week ended—		Med-ian 1943-47	Week ended—		Med-ian 1943-47	Week ended—		Med-ian 1943-47
	Jan. 10, 1948	Jan. 4, 1947		Jan. 10, 1948	Jan. 4, 1947		Jan. 10, 1948	Jan. 4, 1947		Jan. 10, 1948 <sup>1</sup>	Jan. 4, 1947	
NEW ENGLAND												
Maine.....	0	1	0	19	48	35	0	0	0	0	0	0
New Hampshire.....	0	1	0	2	7	6	0	0	0	0	0	0
Vermont.....	1	1	0	8	12	5	0	0	0	0	0	0
Massachusetts.....	0	0	0	96	144	261	0	0	0	0	3	1
Rhode Island.....	0	0	0	8	10	12	0	0	0	0	0	0
Connecticut.....	0	0	0	12	26	49	0	0	0	0	0	1
MIDDLE ATLANTIC												
New York.....	9	4	4	209	226	329	0	0	0	1	1	2
New Jersey.....	1	1	1	51	94	76	0	0	0	0	0	0
Pennsylvania.....	0	3	0	181	113	197	0	0	0	9	2	3
EAST NORTH CENTRAL												
Ohio.....	0	1	1	249	284	284	0	1	0	0	4	3
Indiana.....	3	5	1	63	103	103	1	1	1	0	2	1
Illinois.....	2	2	0	129	129	213	0	0	0	0	1	2
Michigan <sup>2</sup> .....	0	1	0	85	165	66	0	0	0	0	1	0
Wisconsin.....	0	13	1	59	69	145	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota.....	0	0	0	54	32	53	0	0	0	0	0	0
Iowa.....	2	2	0	38	17	53	0	0	0	0	0	0
Missouri.....	0	2	1	35	35	52	1	0	0	0	0	0
North Dakota.....	0	0	0	6	6	11	0	0	0	0	0	0
South Dakota.....	0	1	0	7	16	38	0	0	0	0	1	0
Nebraska.....	1	1	0	21	10	33	0	0	0	0	0	0
Kansas.....	1	4	0	22	25	80	2	0	0	0	1	1
SOUTH ATLANTIC												
Delaware.....	0	0	0	8	6	6	0	0	0	0	0	0
Maryland <sup>3</sup> .....	0	0	0	44	19	43	0	0	0	0	0	1
District of Columbia.....	0	0	0	13	4	15	0	0	0	0	0	0
Virginia.....	0	2	1	38	25	55	0	0	0	2	0	1
West Virginia.....	0	0	0	19	16	40	0	0	0	0	1	1
North Carolina.....	0	3	0	29	37	78	0	0	0	0	1	0
South Carolina.....	1	0	0	2	26	12	0	0	0	0	1	1
Georgia.....	0	3	1	21	9	14	0	0	0	3	1	1
Florida.....	2	1	0	10	10	8	0	0	0	6	0	0
EAST SOUTH CENTRAL												
Kentucky.....	1	0	0	34	40	40	0	0	0	2	2	1
Tennessee.....	1	0	0	57	15	49	0	0	0	1	1	1
Alabama.....	1	1	0	26	19	22	0	0	0	0	0	0
Mississippi <sup>4</sup> .....	0	1	1	9	4	13	0	1	0	1	1	0
WEST SOUTH CENTRAL												
Arkansas.....	0	0	1	1	3	6	0	0	0	0	0	1
Louisiana.....	0	3	1	2	4	10	0	0	0	1	4	2
Oklahoma.....	0	3	1	14	6	25	0	0	0	0	0	0
Texas.....	2	3	4	53	26	83	0	0	0	11	1	5
MOUNTAIN												
Montana.....	0	0	0	22	5	13	0	0	0	2	0	0
Idaho.....	4	0	0	7	13	13	0	0	1	0	2	0
Wyoming.....	0	0	0	3	5	7	0	0	0	0	0	0
Colorado.....	0	2	0	40	30	30	0	0	0	0	1	1
New Mexico.....	0	0	0	9	6	6	0	0	0	0	0	0
Arizona.....	0	0	1	6	8	10	0	0	0	0	2	0
Utah <sup>5</sup> .....	0	1	1	27	20	43	0	0	0	0	0	0
Nevada.....	0	0	0	2	0	0	0	0	0	0	0	0
PACIFIC												
Washington.....	2	1	3	31	42	45	0	0	0	0	1	1
Oregon.....	3	0	0	18	25	25	0	0	0	2	1	0
California.....	4	12	10	98	86	203	0	0	0	4	2	1
Total.....	41	79	52	1,997	2,080	3,457	4	3	8	45	38	40
Seasonal low week <sup>6</sup> .....	(11th) Mar. 15-21			(32d) Aug. 9-15			(35th) Aug. 30-Sept. 5			(11th) Mar. 15-21		
Total since low.....	10,252	24,876	13,394	24,536	28,766	41,778	25	57	95	3,454	3,566	4,608

<sup>1</sup> Period ended earlier than Saturday.

<sup>2</sup> Dates between which the approximate low week ends. The specific date will vary from year to year.

<sup>3</sup> Including paratyphoid fever reported separately as follows: Georgia 2; Florida 1; Texas 5; Oregon 1; California 4.

Telegraphic morbidity reports from State health officers for the week ended January 10, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended January 10, 1948							
	Week ended—		Median, 1943-47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Jan. 10, 1948	Jan. 4, 1947		Amebic	Bacillary	Un- specified					
NEW ENGLAND											
Maine.....	81	14	19								
New Hampshire.....	8										
Vermont.....	69	4	17								
Massachusetts.....	140	118	118	1							
Rhode Island.....	18	11	11		2						
Connecticut.....	45	10	31								
MIDDLE ATLANTIC											
New York.....	156	166	167	1			1				
New Jersey.....	76	94	91	1							
Pennsylvania.....	80	158	141						1		
EAST NORTH CENTRAL											
Ohio.....	85	86	86			2					
Indiana.....	48	15	15								
Illinois.....	62	70	70	2	6		2		2		
Michigan.....	90	228	43	1							
Wisconsin.....	116	134	86				1		1		
WEST NORTH CENTRAL											
Minnesota.....	87	1	28								
Iowa.....	9	5	6	1							
Missouri.....	23	11	11			1			5		
North Dakota.....	7	1	1								
South Dakota.....	7	1	1								
Nebraska.....	26	3	3	1							
Kansas.....	56	19	22						1		
SOUTH ATLANTIC											
Delaware.....	1	4	4								
Maryland.....	43	40	40						4		
District of Columbia.....	7	6	6						1		
Virginia.....	115	75	61			72			5		
West Virginia.....	13	10	18								
North Carolina.....	32	13	71	1				1			
South Carolina.....	66	62	63	1	4				2	3	
Georgia.....	17	8	8		1				4	2	
Florida.....	18	9	9	2						3	
EAST SOUTH CENTRAL											
Kentucky.....	12	46	20								
Tennessee.....	36	9	12			3			9	1	
Alabama.....	29	15	15						1	3	
Mississippi.....	6			2					1		
WEST SOUTH CENTRAL											
Arkansas.....	57	23	22	1		4					
Louisiana.....	11	1	2	2					1		
Oklahoma.....	16		5	1							
Texas.....	371	139	145	16	395	462			1	8	5
MOUNTAIN											
Montana.....	3	1	7								
Idaho.....	29	5	3								
Wyoming.....	2	1	5	1							
Colorado.....	82	6	17						1		
New Mexico.....	23	1	2		10						
Arizona.....	29	23	22			42					
Utah.....	14	3	12								
Nevada.....			1								
PACIFIC											
Washington.....	5	6	21								
Oregon.....	9	12	13								
California.....	82	79	98	4	3		1				
Total.....	2,417	1,746	1,746	39	421	586	5	1	40	20	70
Same week: 1947.....	1,746			37	322	473	4	1	51	37	86
Median, 1943-47.....	1,746			22	322	101	6	0	39	67	55

<sup>1</sup> Period ended earlier than Saturday.

<sup>2</sup> 3-year median, 1945-47.

Alaska: Reports no cases of these communicable diseases.

Territory of Hawaii, week ended Jan. 10, 1948: Amebic dysentery 1, bacillary dysentery 6, influenza 1, measles 2, whooping cough 31.

## WEEKLY REPORTS FROM CITIES\*

City reports for week ended January 3, 1948

This table lists the reports from 89 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Pollomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0		0	1	0	1	0	2	0	0	
New Hampshire:												
Concord	0	0		0		0	2	0	0	0	0	
Vermont:												
Barre	0	0		0		0	0	0	0	0	0	
Massachusetts:												
Boston	7	0		0	87	1	17	0	30	0	0	20
Fall River	0	0		0		0	0	0	0	0	0	6
Springfield	0	0		0		0	1	0	2	0	0	5
Worcester	0	0		0		0	10	1	7	0	0	
Rhode Island:												
Providence	0	0		0		0	0	0	1	0	0	10
Connecticut:												
Bridgeport	0	0		0	4	0	0	0	0	0	0	
Hartford	0	0		0	1	0	0	0	3			7
New Haven	0	0		0		3	2	0	1	0	0	1
MIDDLE ATLANTIC												
New York:												
Buffalo	1	0		0		1	5	0	3	0	0	15
New York	12	1	5	2	183	4	88	0	50	0	1	18
Rochester	0	0		1		0	2	2	5	0	0	2
Syracuse	1	0		0		0	1	0	5	0	0	6
New Jersey:												
Camden	0	0		0		1	6	0	1	0	0	
Newark	0	0		0	2	0	1	0	7	0	0	2
Trenton	0	0		0	3	0	2	0	0	0	0	
Pennsylvania:												
Philadelphia	2	0	7	4	28	2	15	0	30	0	1	14
Pittsburgh	1	0	2	2	2	0	18	0	10	0	1	6
Reading	0	0		0	2	0	3	0	3	0	0	2
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	1	0	1	0	9	1	4	0	9	0	0	
Cleveland	1	0	3	1	2	0	4	0	14	0	0	23
Columbus	0	0	1	1	53	0	6	0	5	0	0	8
Indiana:												
Fort Wayne	0	0		0	2	0	5	0	4	0	0	
Indianapolis	2	1		0	17	1	1	0	5	0	0	1
South Bend	0	0		0		0	0	0	0	0	0	
Terre Haute	0	0		0	4	0	2	0	0	0	0	1
Illinois:												
Chicago	0	0		0	284	4	28	0	33	0	0	11
Michigan:												
Detroit	1	0		0	4	0	12	0	23	0	1	24
Flint	0	0		0	1	0	0	0	2	0	0	
Grand Rapids	0	0		0	90	0	2	0	4	0	0	5
Wisconsin:												
Kenosha	0	0		0	5	0	0	0	0	0	0	
Milwaukee	0	0	2	2	2	0	5	0	6	0	0	6
Racine	0	0		0	1	0	2	0	1	0	0	2
Superior	0	0		0		0	0	0	3	0	0	1
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0		0	1	0	0	0	7	0	0	14
Minneapolis	0	0		0	62	1	6	0	17	0	0	10
St. Paul	1	0		0	4	0	6	0	4	0	0	5
Missouri:												
Kansas City	0	0	8	0	1	1	9	0	4	0	0	15
St. Joseph	0	0		0		0	0	0	2	0	0	
St. Louis	2	0		1	13	1	5	0	11	0	0	

\* In some instances the figures include nonresident cases.

## City reports for week ended January 3, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Polio myelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha.....	0	0		0		0	3	0	3	0	0	
Kansas:												
Topeka.....	0	0		0		0	3	0	1	0	0	1
Wichita.....	0	0		0	1		2	0		0		3
SOUTH ATLANTIC												
Delaware:												
Wilmington.....	0	0		0	5	0	5	0	4	0	0	
Maryland:												
Baltimore.....	0	0	1	0	0	0	3	0	4	0	1	20
Cumberland.....	12	0		0		0	2	0	2	0	0	
Frederick.....	0	0		0		0	0	0	0	0	0	
District of Columbia:												
Washington.....	0	0	1	0	70	0	9	0	7	0	0	14
Virginia:												
Lynchburg.....	0	0		0		0	2	0	1	0	0	8
Richmond.....	0	0		0		0	5	0	4	0	0	1
Roanoke.....	0	0		0	1	0	0	0	0	0	0	
West Virginia:												
Charleston.....	0	0		0		0	0	0	0	0	0	
Wheeling.....	0	0		0	1	0	1	0	0	0	0	2
North Carolina:												
Raleigh.....	0	0		0		0	3	0	0	0	0	1
Wilmington.....	2	0		0	1	0	4	0	0	0	0	1
Winston-Salem.....	0	0		0		0	2	0	4	0	0	
South Carolina:												
Charleston.....	0	0	120	0		0	1	0	2	0	0	2
Georgia:												
Atlanta.....	0	0	24	0		0	1	0	2	0	0	1
Brunswick.....	0	0		0		0	2	0	0	0	0	
Savannah.....	0	0		0		0	1	0	0	0	0	2
Florida:												
Tampa.....	3	0		0	3	0	7	0	1	0	0	
EAST SOUTH CENTRAL												
Tennessee:												
Memphis.....	4	0		1	8	0	8	1	0	0	1	1
Nashville.....	0	0		0		0	2	0	1	0	0	
Alabama:												
Birmingham.....	1	0		0	1	0	5	0	3	0	0	
Mobile.....	0	0	15	2		0	2	0	1	0	0	5
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock.....	1	0		0		0	0	0	1	0	0	
Louisiana:												
New Orleans.....	3	0	4	1		0	5	0	1	0	0	2
Shreveport.....	0	0		0		0	5	0	0	0	0	
Oklahoma:												
Oklahoma City.....	0	0		0		0	1	0	6	0	0	1
Texas:												
Dallas.....	1	0		0	1	0	4	0	3	0	0	5
Galveston.....	0	0		1		0	6	0	0	0	0	
Houston.....	5	0		2	1	1	9	0	2	0	0	2
San Antonio.....	0	0	1	0		0	8	0	0	0	0	
MOUNTAIN												
Montana:												
Billings.....	0	0		0	25	0	0	0	0	0	0	
Great Falls.....	0	0		0	2	0	1	0	0	0	0	
Helena.....	0	0		0		0	0	0	0	0	0	
Missoula.....	0	0		0		0	0	0	0	0	0	4
Idaho:												
Boise.....	0	0		0		0	2	0	0	0	0	
Colorado:												
Denver.....	0	0	5	0	9	0	3	0	8	0	0	28
Pueblo.....	0	0		0		0	1	0	4	0	0	27
Utah:												
Salt Lake City.....	0	0		1	15	0	1	1	1	0	0	

## City reports for week ended January 3, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Polymyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle.....	1	0		0		0	2	2	2	0	0	9
Spokane.....	0	0		0	1	0	2	1	0	0	0	4
Tacoma.....	0	0		0	34	0	0	0	0	0	0	
California:												
Los Angeles.....	1	0	174	3	18	2	3	0	5	0	0	12
Sacramento.....	0	0	1	1	1	0	3	1	0	0	0	
San Francisco.....	0	0		0	51	1	6	0	3	0	0	1
Total.....	66	2	375	26	1,117	25	406	9	391	0	6	415
Week ended Jan. 4, 1947 <sup>1</sup>	92		52	16	881		408		468		5	498
Average 1943-47 <sup>1</sup>	76		1,443	52	1,505		497		921		9	589

<sup>1</sup> Exclusive of Oklahoma City.<sup>2</sup> 3-year average, 1945-47.<sup>3</sup> 5-year median, 1943-47.

Dysentery, amebic.—Cases: Boston 1; New York 6; New Orleans 3; Los Angeles 1.

Dysentery, bacillary.—Cases: Los Angeles 2.

Dysentery, unspecified.—Cases: San Antonio 2.

Rocky Mountain spotted fever.—Cases: Baltimore 1.

Tularemia.—Cases: Cleveland 2; St. Louis 1; New Orleans 1.

Typhus fever, endemic.—Cases: New York 1; Tampa 1; Nashville 1.

## Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (latest available estimated population, 34,530,200)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Pollomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England.....	18.3	0.0	0.0	0.0	243	10.5	86.3	2.6	120	0.0	0.0	162
Middle Atlantic.....	7.9	0.5	6.5	4.2	102	3.7	65.3	0.9	53	0.0	1.4	30
East North Central.....	3.1	0.6	4.3	2.5	291	3.7	43.5	0.0	67	0.0	0.6	50
West North Central.....	6.0	0.0	16.1	2.0	165	6.0	68.4	0.0	101	0.0	0.0	107
South Atlantic.....	27.8	0.0	238.6	0.0	132	0.0	78.5	0.0	51	0.0	1.6	85
East South Central.....	29.5	0.0	88.5	17.7	53	0.0	100.3	5.9	30	0.0	5.9	35
West South Central.....	25.4	0.0	12.7	10.2	5	2.5	96.5	0.0	33	0.0	0.0	25
Mountain.....	0.0	0.0	39.7	7.9	405	0.0	63.5	7.9	103	0.0	0.0	469
Pacific.....	3.2	0.0	276.8	6.3	166	4.7	25.3	6.3	16	0.0	0.0	41
Total.....	10.0	0.3	56.8	3.9	169	3.8	61.5	1.4	59	0.0	0.9	63

## TERRITORIES AND POSSESSIONS

## Hawaii Territory

*Plague (rodent).*—A rat found dead on November 26, and another rat found dead on November 28, 1947, both in Kukuihaele area, Hamakua District, Island of Hawaii, T. H., have been proved positive for plague.

## Panama Canal Zone

*Notifiable diseases—November 1947.*—During the month of November 1947, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Residence <sup>1</sup>									
	Panama City		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	5						2		7	
Diphtheria	28	1			1		13	2	42	3
Dysentery:										
Amebic	2				1		2	1	5	1
Bacillary	2		1		5		1	1	9	1
Leprosy							1		1	
Malaria <sup>2</sup>	9		2		5		207	8	223	8
Measles					1				1	
Meningitis, meningococcus	1						1		2	
Pneumonia		12		3	14	2		5	<sup>3</sup> 14	22
Tuberculosis		23		7	12			7	<sup>3</sup> 12	37
Typhoid fever							1	1	1	1

<sup>1</sup> If place of infection is known, cases are so listed instead of by residence.

<sup>2</sup> 13 recurrent cases.

<sup>3</sup> In the Canal Zone only.

## FOREIGN REPORTS

### CANADA

*Provinces—Communicable diseases—Week ended December 20, 1947.*—During the week ended December 20, 1947, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox.....		39	6	206	489	33	61	124	108	1,066
Diphtheria.....				7	12	3	1		1	24
Dysentery:										
Amebic.....					2					2
Bacillary.....					2					2
German measles.....		1		5	15	3		6	8	38
Influenza.....		7			17				5	29
Measles.....		2	1	210	399	19	4	6	55	696
Meningitis, meningococcus.....					2					2
Mumps.....		19	1	149	206	27	76	68	35	581
Poliomyelitis.....		2			4	1	11		1	19
Scarlet fever.....		5	7	67	98	5	2		10	194
Tuberculosis (all forms).....		5	6	71	63	4	9	12	101	271
Typhoid and paratyphoid fever.....				5	4				3	12
Undulant fever.....									1	1
Venereal diseases:										
Gonorrhea.....		9	14	61	69	29	23	69	112	386
Syphilis.....		9		61	46	10	5	7	43	188
Other forms.....									4	4
Whooping cough.....			1	25	86	17	3	89	29	250

### JAPAN

*Notifiable diseases—4 weeks ended November 29, 1947, and accumulated totals for the year to date.*—For the 4 weeks ended November 29, 1947, and for the year to date, certain notifiable diseases were reported in Japan as follows:

Disease	4 weeks ended Nov. 29, 1947		Total reported for the year to date	
	Cases	Deaths	Cases	Deaths
Diphtheria.....	2,350	191	26,382	2,167
Dysentery, unspecified.....	702	250	39,001	7,292
Encephalitis, Japanese "B".....	1	1	252	131
Gonorrhea.....	15,938		196,527	
Influenza.....	165		2,886	
Malaria.....	363	2	11,541	23
Measles.....	2,506		462,842	
Meningitis, epidemic.....	72	34	3,277	1,072
Paratyphoid fever.....	211	18	4,529	260
Pneumonia.....	6,636		107,756	
Scarlet fever.....	233	5	2,452	57
Smallpox.....	3	0	390	38
Syphilis.....	11,672		135,142	
Tuberculosis.....	22,183		268,609	
Typhoid fever.....	872	147	17,125	2,139
Typhus fever.....	17	0	1,035	83
Whooping cough.....	2,881		126,055	

<sup>1</sup> Suspected.

<sup>2</sup> Suspected; diagnosis confirmed in 7 cases.

<sup>3</sup> For the period Mar. 30 to Nov. 29, 1947.

## NEW ZEALAND

*Notifiable diseases—4 weeks ended November 29, 1947.*—During the 4 weeks ended November 29, 1947, certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis.....	13	1	Ophthalmia neonatorum.....	1	-----
Diphtheria.....	35	1	Polioimyelitis.....	26	-----
Dysentery:			Puerperal fever.....	5	-----
Amebic.....	3	-----	Scarlet fever.....	61	-----
Bacillary.....	9	-----	Tetanus.....	1	1
Erysipelas.....	6	-----	Tuberculosis (all forms).....	202	56
Food poisoning.....	1	-----	Typhoid fever.....	50	1
Lethargic encephalitis.....	1	-----	Undulant fever.....	9	-----

## NORWAY

*Notifiable diseases—September 1947.*—During the month of September 1947, cases of certain notifiable diseases were reported in Norway as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis.....	17	Mumps.....	433
Diphtheria.....	74	Paratyphoid fever.....	16
Dysentery.....	12	Pneumonia (all forms).....	982
Epidemic encephalitis.....	8	Polioimyelitis.....	176
Erysipelas.....	518	Rheumatic fever.....	122
Gastroenteritis.....	7, 106	Scabies.....	3, 484
Gonorrhea.....	609	Scarlet fever.....	371
Hepatitis, epidemic.....	263	Syphilis.....	131
Impetigo contagiosa.....	4, 319	Tuberculosis (all forms).....	331
Influenza.....	1, 639	Typhoid fever.....	3
Laryngitis.....	6, 788	Well's disease.....	1
Malaria.....	1	Whooping cough.....	481
Measles.....	43		

## SWITZERLAND

*Notifiable diseases—July–September 1947.*—For the months of July, August, and September 1947, cases of certain notifiable diseases were reported in Switzerland as follows:

Disease	July	August	September	Disease	July	August	September
Cerebrospinal meningitis.....	9	9	1	Mumps.....	107	38	72
Chickenpox.....	179	74	83	Paratyphoid fever.....	17	59	30
Diphtheria.....	303	272	401	Polioimyelitis.....	153	210	136
Dysentery.....	6	1	8	Scarlet fever.....	345	316	568
Hepatitis, epidemic.....	30	35	45	Tuberculosis.....	380	283	327
Influenza.....	9	2	41	Typhoid fever.....	12	20	13
Lethargic encephalitis.....	1	1	-----	Undulant fever.....	18	6	12
Malaria.....	-----	-----	1	Whooping cough.....	372	309	299
Measles.....	586	271	255				

### WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From consular reports, international health organizations, medical officers of the Public Health Service, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

## CHOLERA

[C indicates cases]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place	January-October 1947	November 1947	December 1947—week ended—			
			6	13	20	27
AFRICA						
Egypt.....	C	11,495	10,392	14	3	
Alexandria.....	C	150	53			
Cairo <sup>1</sup> .....	C	118	15			
Ismailiya.....	C	90	9			
Port Said.....	C	29	7			
Suez.....	C	20	1			
ASIA						
Arabia: Amirate of Dubay.....	C		1			
Burma.....	C	257	4		2	
Moulmein.....	C	64	2			
Rangoon.....	C	4				
China:						
Anhui Province.....	C	6				
Chekiang Province.....	C	202				
Pingyang.....	C	140				
Wenchow.....	C	1				
Formosa (Island of).....	C	14				
Fukien Province.....	C	16				
Foochow.....	C	2				
Honan Province.....	C	936				
Hunan Province.....	C	16				
Kiangsi Province.....	C	102				
Kiangsu Province.....	C	738				
Chinkiang.....	C	8				
Shanghai.....	C	53				
Tsingkiang.....	C	9				
Kwangtung Province.....	C	6				
Hong Kong.....	C	6				
Suiyuan Province.....	C	52				
Szechwan Province.....	C	5				
India.....	C	122,196	19,556	2,444	2,272	
Ahmadabad.....	C	27				
Allahabad.....	C	70				
Bombay.....	C	113	1			
Calcutta.....	C	4,389	176	33	26	35
Cawnpore.....	C	324	7		1	
Chittagong.....	C	32				
Lahore.....	C	1,888	264	16	4	
Lucknow.....	C	286	2			
Madras.....	C	11	14	2		
Nagpur.....	C	33	5			
New Delhi.....	C	35				
India (French):						
Chandernagor.....	C	35				
Karikal.....	C	4	11			
Pondicherry.....	C	37				
India (Portuguese).....	C	28	23			
Indochina (French):						
Annam.....	C	20	6		11	
Cambodia.....	C	1,071	69			26
Cochinchina.....	C	491	35			14
Bien Hoa.....	C	7				
Chaudoc.....	C	1				
Cholon.....	C	33				
Giadinh.....	C	11				
Longxuyen.....	C	6				
Mytho.....	C	5	1			
Rachgia.....	C	22				
Saigon.....	C	135				1
Vinh-long.....	C	8				
Laos.....	C	55				
Tonkin.....	C	67				
Siam (Thailand).....	C	3,350	43			
Bangkok.....	C	777	1			
Straits Settlement: Penang.....	C	21				
Syria.....	C					45

<sup>1</sup> For the week ended Jan. 3, 1948, 1 case of cholera was reported in Cairo.

<sup>2</sup> For the period Dec. 1-20, 1947.

<sup>3</sup> Imported.

<sup>4</sup> For the period Dec. 20, 1947 to Jan. 3, 1948.

## PLAGUE

[C indicates cases; D, deaths]

Place		Janu- ary- October 1947	Novem- ber 1947	December 1947—week ended—			
				6	13	20	27
AFRICA							
Belgian Congo	C	17		1	2	1	
British East Africa:							
Kenya	C	52	7		1		
Uganda	C	1					
Egypt: Alexandria	C	24					
Madagascar	C	205	18				
Mananjary	C	5					
Union of South Africa	C	25	9	4		1	3
ASIA							
Burma	C	1,256	4		14		
Bassein	C	42					
Mandalay	C	17					
Rangoon	C	19					
China:							
Chekiang Province	C	116	25				
Formosa (Island of)	C	1					
Fukien Province	C	700	25				
Amoy	C	13					
Foochow	C	31	9				
Kiangsi Province	C	214	75		116		
Nanchang	C	42	4				
Kiangsu Province	C	30					
Shanghai	C	28					
Kwangtung Province	C	77					
Yunnan Province	C	216	33				
India	C	70,431	2,804				
Indochina (French):							
Annam	C	81	5			3	
Cochinchina	C	31					
Java	C	38	1				
Korea	C	22					
Manchuria	D	100					
Palestine	C	39	3	1			
Siam (Thailand)	C	48	2				
Syria	C	6					
Turkey: Akcakale	C	19					
EUROPE							
Germany: East Prussia. <sup>7</sup>							
Portugal: Azores	C	4					
Turkey (see Turkey in Asia).							
NORTH AMERICA							
Canada. <sup>8</sup>							
SOUTH AMERICA							
Argentina:							
Cordoba Province	C	1					
Santa Fe Province	C	3					
Brazil: <sup>9</sup>							
Ceara State	C	2					
Minas Geraes State	C	7					
Parahyba State	C	3					
Pernambuco State	C	4					
Ecuador:							
Chimborazo Province	C	4					
Loja Province	C	20	2				
Peru:							
Ancash Department	C		1				
Lambayeque Department	C	10					
Libertad Department	C	20					
Lima Department	C	42	7				
Piura Department	C	78	1				
OCEANIA							
Hawaii Territory: Plague infected rats <sup>11</sup>		1	2				

<sup>1</sup> Includes 5 cases of pneumonic plague.<sup>4</sup> Imported.<sup>2</sup> Includes 64 cases of pneumonic plague.<sup>5</sup> Includes 12 cases of pneumonic plague.<sup>3</sup> Includes 2 cases of pneumonic plague.<sup>6</sup> Period not specified.<sup>7</sup> During June 1947, an outbreak of plague with high mortality occurred in Königsberg, East Prussia, Germany.<sup>8</sup> For the period July 5 to Sept. 20, 1947, 6 lots of plague infected fleas from squirrels were reported in Alberta and Saskatchewan Provinces, Canada.<sup>9</sup> In addition, 7 cases of plague were reported in Brazil for the period Jan. 1 to May 31, 1947, specific localities not being given.<sup>10</sup> In addition 82 cases with 65 deaths in Ayabaca Province and 58 cases with 48 deaths in Huancabamba Province, all unconfirmed, were reported for the period September 1946 to March 1947.<sup>11</sup> Plague infection was also reported in Hawaii Territory as follows: On Jan. 9, 1947, in a pool of 31 rats, on Mar. 20, 1947, in a pool of 32 fleas collected from 59 rats.

## SMALLPOX

[C indicates cases; P, present]

Place	Janu- ary- October 1947	Novem- ber 1947	December 1947—week ended—			
			6	13	20	27
AFRICA						
Algeria.....	C	164				
Angola.....	C	241				
Basutoland.....	C	1				
Bechuanaland.....	C	38				
Belgian Congo.....	C	<sup>1</sup> 2,272	194	35		
British East Africa:						
Kenya.....	C	440	19			
Nyasaland.....	C	1,356	398			
Tanganyika.....	C	2,527	176	30		
Uganda.....	C	527	32	18		
Cameroon (French).....	C	135	7			
Dahomey.....	C	140	10		7	
Egypt.....	C	482	2	1		
Ethiopia.....	C	30				
French Equatorial Africa.....	C	9	3			
French Guinea.....	C	408	19			
Gambia.....	C	6				
Gold Coast.....	C	777	109	18		
Ivory Coast.....	C	2,515	201	<sup>2</sup> 132		
Liberia.....	C	37				
Libya.....	C	2,158	93	7	1	38
Mauritania.....	C	23				
Morocco (French).....	C	56	1		<sup>2</sup> 3	
Morocco (Int. Zone).....	C	12				
Morocco (Spanish).....	C	29				
Mozambique.....	C	3				
Nigeria.....	C	4,734	160			
Niger Territory.....	C	2,480	96			
Portuguese Guinea.....	C	3				
Rhodesia:						
Northern.....	C	60	18	3		
Southern.....	C	476				
Senegal.....	C	16	1			
Sierra Leone.....	C	374				
Sudan (Anglo-Egyptian).....	C	297	419	59	36	99
Sudan (French).....	C	379	14			
Swaziland.....	C	10				
Togo (French).....	C	87				1
Tunisia.....	C	810	206			
Union of South Africa.....	C	503	P	P		
ASIA						
Arabia.....	C	1				
Burma.....	C	2,788	45	6		15
Ceylon.....	C	1				
China.....	C	2,937	98	14	27	40
India.....	C	47,095	2,160			45
India (French).....	C	10				
India (Portuguese).....	C	3	9			
Indochina (French).....	C	4,506	131		<sup>2</sup> 200	
Iran.....	C	82	111			
Iraq.....	C	14	27	1	13	6
Japan.....	C	387	3			
Korea.....	C	125				
Lebanon.....	C		1	5		15
Malay States (Federated).....	C	3,650	297	130	58	
Manchuria.....	C	7				
Netherland East Indies.....	C		4			
Portuguese Timor.....	C	32				
Siam (Thailand).....	C	1,264	59			
Straits Settlements.....	C	99				
Syria.....	C	3	2			7
Turkey (see Turkey in Europe).....						
EUROPE						
Belgium.....	C	<sup>1</sup> 23				
France.....	C	48				
Germany.....	C	12				
Great Britain: England and Wales.....	C	77				
Greece.....	C	10				
Irish Free State.....	C	<sup>4</sup> 1				
Italy.....	C	68				
Luxemburg.....	C	<sup>1</sup> 2				
Portugal.....	C	79	104	13	2	
Spain.....	C	30	1			
Switzerland.....	C	<sup>4</sup> 1				
Turkey.....	C	3				

See footnotes at end of table.

## SMALLPOX—Continued

Place	January- October 1947	November 1947	December 1947—week ended—			
			6	13	20	27
NORTH AMERICA						
Guatemala.....	C	12				
Mexico.....	C	942				
Panama (Republic).....	C	41				
SOUTH AMERICA						
Argentina.....	C	38				
Brazil.....	C	424	6			
Colombia.....	C	3,439	15			
Ecuador.....	C	1,682	650			
Ecuador.....	C	1,788	142			
Paraguay.....	C	369				
Peru.....	C	1,279				
Uruguay.....	C	14,493	1,294	154	145	
Venezuela.....	C					

<sup>1</sup> Includes alastrim.<sup>2</sup> For the period Dec. 1-10, 1947.<sup>3</sup> For the period Dec. 1-20, 1947.<sup>4</sup> Imported.

## TYPHUS FEVER\*

[C indicates cases; P, present]

<b>AFRICA</b>							
Algeria	C	197					
Basutoland	C	15					
Bechuanaland	C	1					
Belgian Congo	C	335	36	1			
British East Africa:							
Kenya <sup>1</sup>	C	26	3				
Uganda	C	2					
Egypt	C	118	12	1			4
Eritrea	C	625	68	5	30		
Ethiopia	C	255					
French West Africa <sup>2</sup>	C	2					
Gold Coast	C	6					
Libya	C	309	2	3	5	5	
Morocco (French)	C	124	1				
Morocco (International Zone)	C	27					
Morocco (Spanish)	C	88					
Nigeria <sup>1</sup>	C	16	2				
Rhodesia:							
Northern	C	1					
Southern	C	1					
Senegal	C	2					
Sierra Leone	C	3					
Sudan (Anglo-Egyptian)	C	1					
Tunisia <sup>1</sup>	C	650	13				
Union of South Africa <sup>1</sup>	C	283	P		P		
<b>ASIA</b>							
Arabia <sup>1</sup>	C	2					
Burma	C	3					
Ceylon	C	2	1				
China <sup>1,2</sup>	C	85	7		3		1
India	C	7					
Indochina (French)	C	69	7		1	1	
Iran	C	243	3				
Iraq	C	291	3	2	3	2	
Japan	C	1,016	19		21		
Java	C	1					
Korea	C	1,261					
Malay States (Federated) <sup>1</sup>	C	50					
Manchuria	C	12					
Palestine <sup>1</sup>	C	198	5				
Siam (Thailand)	C	4					
Straits Settlements <sup>1</sup>	C	7	3				
Syria	C	32					1
Trans-Jordan	C	20					
Turkey (see Turkey in Europe).							

See footnotes at end of table.

## TYPHUS FEVER—Continued

Place	Janu- ary- October 1947	Novem- ber 1947	December 1947—week ended—			
			6	13	20	27
EUROPE						
Austria <sup>1</sup>	C	8				
Bulgaria	C	813	34	3		
Czechoslovakia	C	38	3	1		
France	C	4				
Germany	C	24	1		1	
Great Britain: Malta and Gozo <sup>2</sup>	C	22	2			
Greece <sup>1</sup>	C	339	32	5	9	11
Hungary	C	588	11		2	3
Italy	C	65	4			
Sicily	C	29				
Luxemburg	C		4	1		
Netherlands <sup>1</sup>	C	1	2			
Norway <sup>2</sup>	C	1				
Poland	C	466	32			
Portugal	C	4				
Rumania <sup>1</sup>	C	23,327	1,134			
Spain	C	161	23			
Switzerland <sup>2</sup>	C	6				
Turkey	C	519	86	11	11	19
Yugoslavia	C	192	11	2	6	
NORTH AMERICA						
Costa Rica <sup>2</sup>	C	101				
Cuba <sup>2</sup>	C	9				
Guatemala	C	316				
Jamaica <sup>2</sup>	C	37	4			
Mexico	C	1,625				
Nicaragua	C	2				
Panama Canal Zone	C	13				
Panama (Republic)	C	421				
Puerto Rico <sup>2</sup>	C	51	1			
Virgin Islands <sup>2</sup>	C	2				
SOUTH AMERICA						
Argentina <sup>1</sup>	C	16				
Brazil	C	33	15	2	4	3
Chile <sup>1</sup>	C	398				10
Colombia	C	2,024				
Curacao <sup>2</sup>	C	1				
Ecuador <sup>1</sup>	C	526	48			
Peru	C	1,050				
Venezuela <sup>1</sup>	C	161				
OCEANIA						
Australia <sup>2</sup>	C	151	12			
Hawaii Territory <sup>2</sup>	C	30	1			1

\* Reports from some areas are probably murine type, while others probably include both murine and louse-borne types.

<sup>1</sup> Includes murine type.

<sup>2</sup> Murine type.

<sup>3</sup> Information dated December 10, 1947, stated that 100 deaths from typhus fever daily had occurred in Sinkiang Province, China, and spreading in Tihwa.

<sup>4</sup> Includes imported cases.

## YELLOW FEVER

[C indicates cases; D, deaths]

AFRICA						
Nigeria: Ossiommo leper settlement.....C						11
Sudan (French): Bamako.....C	2	1				
SOUTH AMERICA						
Brazil:						
Bahia State.....D	1					
Para State.....D	1					
Colombia:						
Antioquia Department.....C	<sup>2</sup> 7	1				
Boyaca Department.....D	3	1				
Caldas Department.....D	6	2				
Cundinamarca Department.....D	2					
Intendencia of Meta.....D	7	2				
North Santander Department.....D	1					
Santander Department.....D	29					
Tolima Department.....D	3					
Peru: Huanuco Department.....D	2					

<sup>1</sup> Suspected.

<sup>2</sup> Includes deaths used as cases.

## FEDERAL SECURITY AGENCY

### UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

#### DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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